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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/657,139

09/09/2003

Shinji Ohuchi

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1910

7590

07/14/2004

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EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/657,139	OHUCHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	DiLinh Nguyen	2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 34-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 34-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/9/03</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 34 and 40 are objected to because of the following informalities:

Claim 34 recites the limitation "the plurality of bumps" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 40 recites the limitation "the plurality of bumps" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 34-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egawa (U.S. Pat. 6229215) in view of Imasu et al. (U.S. Pat. 6208525).

- Regarding claims 34 and 39, Egawa discloses a semiconductor device comprising:

a BGA (ball grid array) type semiconductor device 1 including a base plate 10 and a first plurality of bumps 15 formed on a backside surface of the base plate; and

a CSP (chip size package) type semiconductor device 17 mounted on an area of the backside surface of the base plate of the BGA type semiconductor device which does not have any bump formed thereon,

the CSP type semiconductor device 17 having a second plurality of bumps 18;  
a resin 19 covering a main surface of the CSP type semiconductor device 17 and side surfaces of the plurality of bumps 18 (fig. 1b, column 3, lines 55-64).

Egawa does not disclose a plurality of terminals which are formed on a front surface of the CSP type semiconductor device.

Imasu et al. disclose a CSP type semiconductor device 10 having a plurality of terminals 13 which are formed on a front surface thereof and which are electrically connected to a plurality of bumps 15 (fig. 11, column 7, lines 30-35). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Egawa by having the plurality of terminals with the structure as set forth above because as taught by Imasu et al., such terminals would provide electrically connected between the chip and the bumps (fig. 11, column 5, lines 4-6).

- Regarding claims 35 and 40, Imasu et al. disclose the plurality of terminals 13 of the CSP type semiconductor device are electrically connected to the plurality of bumps 15 via wiring patterns 13 (fig. 11, column 5, lines 4-6) and Egawa disclose the plurality of bumps 18 formed on the backside surface of the base plate 10 (fig. 1b, column 3, lines 55-64).
- Regarding claims 36 and 41, Imasu et al. disclose the plurality of terminals 13 of the CSP type semiconductor device are coupled to the wiring patterns 13 via solder joint 15 (fig. 11, column 5, lines 4-6).

- Regarding claims 37 and 42, Egawa et al. disclose the CSP type semiconductor device 17 is mounted on the BGA type semiconductor device 11 so that the front surface of the CSP type semiconductor device faces the backside surface of the base plate 10 (fig. 11, column 5, lines 4-6).
- Regarding claim 38, Egawa et al. disclose the backside surface of the BGA type semiconductor device 11 is mounted to a printed circuit board 50 via the plurality of bumps 15, and the CSP type semiconductor device 17 as mounted on the backside surface of the base plate 30 has a thickness less than a thickness of the plurality of bumps 15 (fig. 7, column 7, lines 9-14).
- Regarding claim 43, Egawa et al. disclose the second surface of the base plate 30 is mounted to a printed circuit board 50 via the solder bumps 15, and the second semiconductor element 17 as mounted on the second surface of the base plate has a thickness less than a thickness of the solder bumps 15 (fig. 7, column 7, lines 9-14).
- Regarding claim 44, Egawa et al. disclose a thickness of the CSP type semiconductor device is less than a thickness of the solder bumps 15 (fig. 1b, column 3, lines 55-64).


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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